

Unit 13 Day 6 p. 354-357: 1-12(all), 36-44(even)
45-56(all), 72, 74

- ① a) C ② Yes ⑤ one-to-one ⑨ (b, a)
b) A ③ No ⑥ $f(a) \neq f(b)$ ⑩ $x=y$ (x, y)
c) B ④ No ⑦ $x, (g \circ f)(x)$ ⑪ $y=x$
d) D ⑧ range, domain ⑫ 3

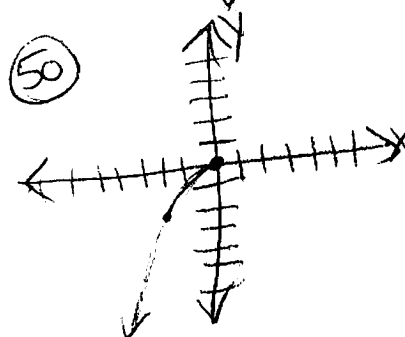
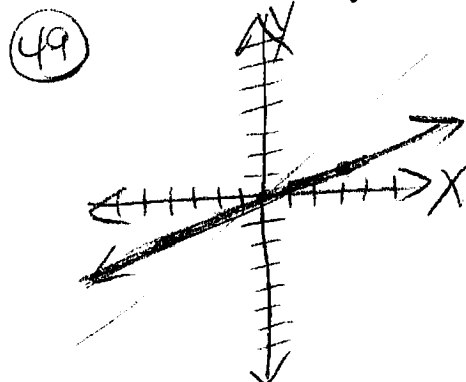
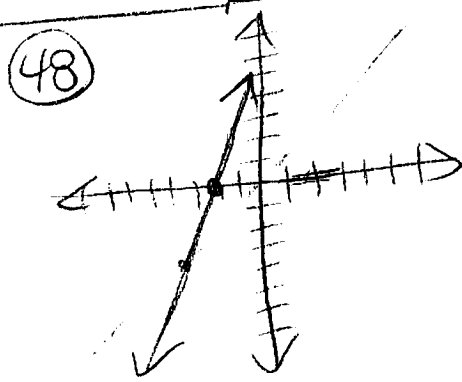
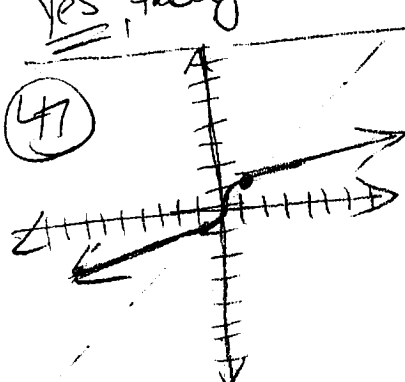
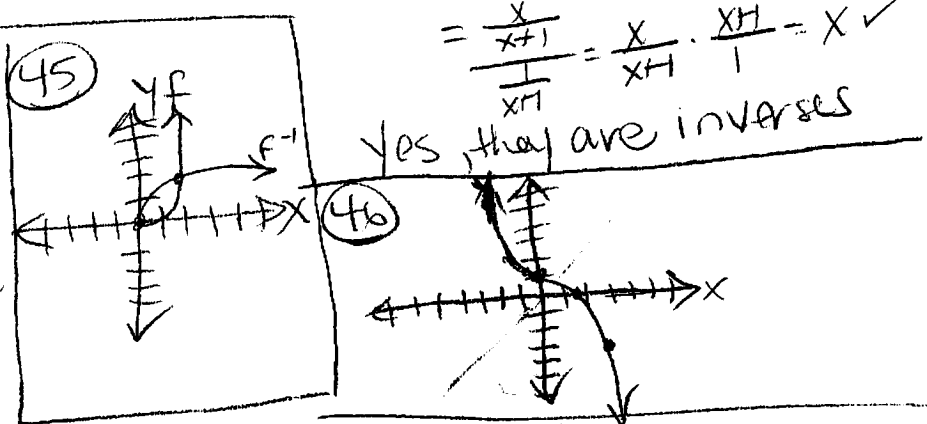
③⑥ yes ④⑦ $f(x) = 8x - 7$ $g(x) = \frac{x+8}{7}$ ④② $f(x) = \frac{1}{x+1}$ $g(x) = \frac{1-x}{x}$

③⑧ No $f(g(x)) = 8\left(\frac{x+8}{7}\right) - 7$
 $= \frac{8x+64}{7} - \frac{49}{7}$
 $= \frac{8x-5}{7} \neq x$

$f(g(x)) = \frac{1}{\frac{1-x}{x} + 1} = \frac{1}{\frac{1}{x}} = x \checkmark$
 $g(f(x)) = \frac{1 - \frac{1}{x+1}}{\frac{1}{x+1}} = \frac{\frac{x+1}{x+1} - \frac{1}{x+1}}{\frac{1}{x+1}} = \frac{\frac{x}{x+1}}{\frac{1}{x+1}} = x \checkmark$

④④ $f(x) = \sqrt{x+8}$, $D: [-8, \infty)$
 $g(x) = x^2 - 8$, $D: [0, \infty)$

$f(g(x)) = \sqrt{x^2 - 8 + 8} = x \checkmark$
 $g(f(x)) = (\sqrt{x+8})^2 - 8 = x + 8 - 8 = x \checkmark$
Yes, they are inverses



⑤① $f^{-1}(4) = 4$
⑤② $f^{-1}(2) = 3$
⑤③ $f^{-1}(0) = 2$
⑤④ $f^{-1}(-2) = 0$

⑤⑤ $f^{-1}(3) = -2$
⑤⑥ $f^{-1}(-4) = 4$

⑤⑦ $f^{-1}(5)$ is the radius of a sphere with a volume of 5π
⑤⑧ $f(2) = 3 \therefore f^{-1}(3) = 2$ or $f^{-1}(f(2)) = 2$